

CONTENTS

FIGURES	vii
TABLES	ix
ACRONYMS	xi
1. INTRODUCTION	1
1.1 PURPOSE AND NEED FOR AGENCY ACTION	1
1.2 SCOPE OF THIS ASSESSMENT	2
1.2.1 PCB Waste	7
1.2.2 Low-Level Waste	7
1.2.3 Mixed Low-Level Waste	7
1.2.4 TRU Waste	7
1.2.5 DMSA Waste	8
2. PROPOSED ACTION AND ALTERNATIVES	9
2.1 PROPOSED ACTION	9
2.1.1 Storage	9
2.1.2 On-Site Treatment	9
2.1.3 Off-site Treatment	10
2.1.4 Waste Transport	10
2.1.5 Waste Disposal	11
2.1.6 Waste Disposition Supporting Activities	11
2.1.7 DMSA Characterization	12
2.2 NO ACTION ALTERNATIVE	12
2.2.1 Storage	12
2.2.2 On-Site treatment	12
2.2.3 Off-site treatment	13
2.2.4 Waste Transport	13
2.2.5 Waste Disposal	13
2.2.6 Waste Disposition Supporting Activities	13
2.2.7 DMSA Characterization	13
2.3 ENHANCED STORAGE ALTERNATIVE	13
2.3.1 Storage	13
2.3.2 On-Site treatment	14
2.3.3 Off-site treatment	14
2.3.4 Waste Transport	14
2.3.5 Waste Disposal	14
2.3.6 Waste Disposition Supporting Activities	14
2.3.7 DMSA Characterization	14
2.4 ALTERNATIVES CONSIDERED BUT DISMISSED	14
2.4.1 On-Site Treatment of All Wastes	14
2.4.2 Off-Site Treatment of All Wastes	14
2.4.3 On-Site Disposal of All Wastes	15
3. AFFECTED ENVIRONMENT	17
3.1 LAND USE	17
3.2 GEOLOGY AND SEISMICITY	17
3.2.1 Geology	17
3.2.2 Seismicity	18

3.3	SOILS AND PRIME FARMLAND.....	18
3.3.1	Soils	18
3.3.2	Prime Farmland.....	19
3.4	WATER RESOURCES AND WATER QUALITY.....	19
3.4.1	Water Resources	19
3.4.2	Water Quality.....	19
3.4.3	Groundwater	20
3.4.4	Floodplains.....	20
3.4.5	Wetlands	20
3.5	ECOLOGICAL RESOURCES	20
3.5.1	Vegetation.....	20
3.5.2	Wildlife	21
3.5.3	Threatened and Endangered Species	22
3.5.4	Parks and Scenic Rivers.....	25
3.6	NOISE	25
3.7	CULTURAL, ARCHAEOLOGICAL, AND NATIVE AMERICAN RESOURCES	27
3.8	CLIMATE AND AIR QUALITY	27
3.8.1	Climate.....	27
3.8.2	Air Quality and Applicable Regulations.....	27
3.8.3	Ambient Air Monitoring Near the Paducah Site.....	27
3.9	SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE.....	30
3.9.1	Socioeconomics	30
3.9.2	Environmental Justice.....	30
3.10	TRANSPORTATION	31
3.10.1	Transportation Routes from the Paducah Site	31
3.10.2	Truck Routes from the Paducah Site to Treatment and Disposal Sites.....	31
3.10.3	Rail Routes from the Paducah Site to Treatment and Disposal Sites	38
4.	ENVIRONMENTAL CONSEQUENCES	49
4.1	IMPACTS OF THE PROPOSED ACTION	49
4.1.1	Resource Impacts	49
4.1.2	On-Site Accident Analysis and Human Health Impacts.....	56
4.1.3	Transportation Impacts	61
4.1.4	On-site Treatment Impacts.....	69
4.1.5	DMSA Characterization	71
4.2	IMPACTS OF THE NO ACTION ALTERNATIVE	72
4.2.1	Resource Impacts	72
4.2.2	Radiological and Nonradiological Impacts.....	74
4.2.3	Accident Analysis	75
4.2.4	Comparison of Accident Risks	76
4.2.5	Transportation Impacts	76
4.2.6	On-Site Treatment Impacts	76
4.3	IMPACTS OF THE ENHANCED STORAGE ALTERNATIVE.....	76
4.3.1	Resource Impacts	76
4.3.2	Radiological and Nonradiological Impacts from the Enhanced Storage Alternative	79
4.3.3	Accident Analysis of the Enhanced Storage Alternative	79
4.3.4	Comparison of Accident Risks	80
4.3.5	Transportation Impacts	80
4.3.6	On-Site Treatment Impacts	80

5.	CUMULATIVE IMPACTS	81
5.1	PADUCAH SITE ACTIVITIES	81
5.1.1	Environmental Management Program	81
5.1.2	Uranium Program	82
5.1.3	UF ₆ Cylinder Storage.....	82
5.1.4	Depleted UF ₆ Conversion Facility	83
5.1.5	Disposal of Nonradioactive Wastes Containing Residual Radioactivity at the C-746-U Landfill	83
5.1.6	Long-Term Management Plan for DOE's Inventory of Potentially Reusable Uranium	83
5.1.7	USEC Programs.....	83
5.2	OTHER REGIONAL INDUSTRIES ACTIVITIES	83
5.3	CUMULATIVE IMPACTS FROM THE PROPOSED ACTION.....	84
5.3.1	Land Use	84
5.3.2	Air Quality	84
5.3.3	Soil and Water Resources	84
5.3.4	Ecological Resources	84
5.3.5	Socioeconomics and Environmental Justice	85
5.3.6	Infrastructure and Support Activities.....	85
5.3.7	Human Health and Accidents	85
5.4	CUMULATIVE IMPACTS FROM THE NO ACTION ALTERNATIVE.....	86
5.4.1	Land Use	86
5.4.2	Air Quality	86
5.4.3	Soil and Water Resources	86
5.4.4	Ecological Resources	86
5.4.5	Socioeconomics and Environmental Justice	86
5.4.6	Infrastructure and Support Activities.....	87
5.4.7	Human Halth and Accidents	87
5.5	CUMULATIVE IMPACTS FROM THE ENHANCED STORAGE ALTERNATIVE	87
5.5.1	Human Health and Accidents	87
5.6	CUMULATIVE IMPACTS COMPARISON	88
6.	REFERENCES	89
	APPENDIX A LIST OF PREPARERS	A-1
	APPENDIX B PERSONS AND AGENCIES CONTACTED	B-1
	APPENDIX C ANALYSIS OF ACCIDENT IMPACTS TO NATURAL RESOURCES	C-1
	APPENDIX D WILDLIFE SPECIES OCCURRING AT THE PADUCAH SITE	D-1
	APPENDIX E CONSULTATION LETTERS AND RESPONSES	E-1
	APPENDIX F BIOLOGICAL ASSESSMENT FOR THE PROPOSED DISPOSITION OF WASTES AT THE PADUCAH SITE, PADUCAH, KENTUCKY	F-1
	APPENDIX G ANALYSIS OF ACCIDENT IMPACTS TO HUMANS.....	G-1
	APPENDIX H TRANSPORTATION ACCIDENT ANALYSIS	H-1
	APPENDIX I ANALYSIS OF WASTE TREATMENT FACILITY AIRBORNE CHEMICAL RELEASES.....	I-1
	APPENDIX J ANALYSIS OF ON-SITE TREATMENT OF LLW AND TRU WASTE.....	J-1
	APPENDIX K EVALUATION OF THE NO ACTION ALTERNATIVE	K-1
	APPENDIX L PUBLIC COMMENT RESPONSE TABLE	L-1

THIS PAGE INTENTIONALLY LEFT BLANK.

FIGURES

3.1	Wind rose patterns of wind speed frequency and directional wind speed at the Barkley Airport.....	28
3.2	Representative route for transportation of waste by truck from Paducah, Kentucky, to Andrews, Texas.....	32
3.3	Representative route for transportation of waste by truck from Paducah, Kentucky, to Deer Park, Texas.....	33
3.4	Representative route for transportation of waste by truck from Paducah, Kentucky, to Hanford, Washington.....	34
3.5	Representative route for transportation of waste by truck from Paducah, Kentucky, to Clive, Utah.....	35
3.6	Representative route for transportation of waste by truck from Paducah, Kentucky, to Mercury, Nevada.....	36
3.7	Representative route for transportation of waste by truck from Paducah, Kentucky, to Oak Ridge, Tennessee.....	37
3.8	Representative route for transportation of waste by truck from Paducah, Kentucky, to Atomic City, Idaho.....	39
3.9	Representative route for transportation of waste by rail from Paducah, Kentucky, to Hobbs, New Mexico.....	40
3.10	Representative route for transportation of waste by rail from Paducah, Kentucky, to Strang, Texas.....	41
3.11	Representative route for transportation of waste by rail from Paducah, Kentucky, to Hanford, Washington.....	42
3.12	Representative route for transportation of waste by rail from Paducah, Kentucky, to Clive, Utah.....	43
3.13	Representative route for transportation of waste by rail from Paducah, Kentucky, to Las Vegas, Nevada.....	44
3.14	Representative route for transportation of waste by rail from Paducah, Kentucky, to Oak Ridge, Tennessee.....	45
3.15	Representative route for transportation of waste by rail from Paducah, Kentucky, to Scoville, Idaho.....	46

THIS PAGE INTENTIONALLY LEFT BLANK

TABLES

1.1	Paducah EA waste information	1
1.2	Additional DOE documents addressing Paducah Site wastes	3
1.3	Summary of Waste Management PEIS Record of Decisions (ROD) Issued to Date for Paducah Site Waste Types.....	5
3.1	Commonwealth of Kentucky threatened, endangered, and “special concern” animal species known from McCracken County, Kentucky.....	26
3.2	Commonwealth of Kentucky threatened, endangered, and “special concern” plant species known from McCracken County, Kentucky.....	26
3.3	Commonwealth of Kentucky ambient air quality standards and highest background levels representative of the Paducah area	29
3.4	Highway route distances from the Paducah Site to each proposed destination.....	31
3.5	Potentially exposed populations along highway routes from the Paducah Site to each proposed destination.....	31
3.6	Rail route distances from the Paducah Site to each proposed destination.....	47
3.7	Potentially exposed populations along railway routes from the Paducah Site to each proposed destination.....	47
4.1	Airborne source term risks	59
4.2	Liquid source term risks	59
4.3	Vehicle impact accident risks	60
4.4	Calculated concentrations of HCl and PCB soot resulting from a PCB fire compared to standard benchmarks	61
4.5	Worst-case radiological impacts for truck shipments (to Mercury, NV)	64
4.6	Cargo-related impacts resulting from truck transportation accidents	65
4.7	Estimated fatalities from truck emissions and accidents (vehicle-related impacts)	66
4.8	Worst-case radiological impacts for rail shipments (to Mercury, Nevada).....	66
4.9	Cargo-related impacts from rail transportation accidents.....	67
4.10	Estimated fatalities from rail-related accidents	68
4.11	Impacts on public health from normal operations of on-site treatment facility.....	70
4.12	Impacts on workers from normal operations of on-site treatment facility	70
5.1	Cumulative impacts comparison	88

THIS PAGE INTENTIONALLY LEFT BLANK

ACRONYMS

AST	airborne source term
BCK	Bayou Creek kilometer
BJC	Bechtel Jacobs Company, LLC
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	<i>Code of Federal Regulations</i>
COE	U.S. Army Corps of Engineers
CX	categorical exclusion
D&D	decommissioning and decontamination
DCG	derived concentration guide
DMSA	DOE Material Storage Area
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EA	environmental assessment
EBE	evaluation-basis earthquake
EPA	U.S. Environmental Protection Agency
ESD	Environmental Sciences Division
ETTP	East Tennessee Technology Park
FFCA	Federal Facility Compliance Agreement
FWS	U.S. Fish and Wildlife Service
HC1	hydrochloric acid
HDDV	heavy duty diesel-powered vehicle
HEPA	high-efficiency particulate air
IDLH	immediately dangerous to life or health
KAR	<i>Kentucky Administrative Regulations</i>
KDEP	Kentucky Department for Environmental Protection
KDFWR	Kentucky Department of Fish and Wildlife Resources
KPDES	Kentucky Pollutant Discharge Elimination System
KSNPC	Kentucky State Nature Preserves Commission
LCD	Lower Continental Deposits
LCF	latent cancer fatality
LDR	land disposal restriction
LLW	low-level radioactive waste
LST	liquid source term
LUK	Little Bayou Creek kilometer
LWD	lost workdays
MEI	maximally exposed individual (off-site individual at site boundary)
MEWC	Materials & Energy/Waste Control Specialists
MIW	maximally exposed involved worker
MLLW	mixed low-level waste
MSL	mean sea level
MUW	maximally exposed unininvolved worker
NAAQS	National Ambient Air Quality Standards
NCS	Nuclear Criticality Safety
NEPA	National Environmental Policy Act of 1969
NRC	U.S. Nuclear Regulatory Commission
ORNL	Oak Ridge National Laboratory
Paducah Site	Paducah Gaseous Diffusion Plant Site

PCB	polychlorinated biphenyl
PPE	personal protective equipment
PSD	prevention of significant deterioration
RCRA	Resource Conservation and Recovery Act of 1976
RGA	Regional Gravel Aquifer
ROD	Record of Decision
ROI	region of influence
RPCB	radiological polychlorinated biphenyl
SIP	state implementation plan
STP	Site Treatment Plan
TRE	toxicity reduction evaluation
TRU	transuranic
TSCA	Toxic Substances Control Act of 1976
TVA	Tennessee Valley Authority
UCD	Upper Continental Deposits
UCRS	Upper Continental Recharge System
USEC	United States Enrichment Corporation
WIPP	Waste Isolation Pilot Plant
WKWMA	West Kentucky Wildlife Management Area
WM-PEIS	Waste Management Programmatic Environmental Impact Statement
WWTP	wastewater treatment plant